ORIGINAL

BEFORE THE

Federal Communications Commission

WASHINGTON, D.C. 20554

In the Matter of	)	
	)	
Rulemaking to Amend Parts, 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5 - 29.5 GHz Frequency Band, to Reallocate the 29.5 - 30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and For Fixed Satellite Services	)	CC Docket No. 92-297
and	)	
Suite 12 Group Petition for Pioneer's Preference	)	PP-22

To: The Commission

COMMENTS OF TRW INC.

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SUMMARY

TRW Inc. ("TRW") has been authorized to establish an NGSO MSS system called "Odyssey™" with service links in the 1.6/2.4 GHz bands, and holds a conditional authorization to establish Odyssey's™ feeder links in 300 MHz of spectrum in the 27.5-30.0 GHz band (the "28 GHz band") for Earth-to-space links and in 300 MHz of spectrum in the 17.7-20.2 GHz (the "19 GHz band") for space-to-Earth links. TRW's requirement for 28 GHz and 19 GHz band spectrum for its feeder links has been a matter of public record for more than four years. Now that it appears that the precise feeder link frequencies proposed by TRW will not be made available for global feeder link operations at the 1995 World Radiocommunication Conference ("WRC-95"), TRW is seeking and is prepared to operate its feeder links in the frequency band segments in the 28 GHz and 19 GHz bands that the United States Government has proposed that WRC-95 make available for MSS feeder link use. TRW is also prepared to share this feeder link allocation with the feeder link operations of the other conditionally-authorized NGSO MSS system that is seeking to operate feeder links in the 28 GHz and 19 GHz bands.

In its Third NPRM, the Commission proposes to segment the 27.5-30.0 GHz band to accommodate LMDS, GSO/FSS, NGSO/FSS, and NGSO MSS feeder link systems. Although the Commission incorrectly presumed that it could satisfy TRW's feeder link requirements in bands other than 28 GHz, even as it went to great lengths to identify and purport to satisfy the stated requirements of all of the other prospective users of 28 GHz band spectrum, TRW nevertheless supports the Commission's

proposal, subject to the adoption of modest sharing principles and fine tuning adjustments that are designed to facilitate co-frequency sharing between NGSO MSS systems such as Odyssey^{TM} and LMDS and GSO/FSS systems.

The system design and business plan for Odyssey^{TM} make it critical that TRW have the opportunity to secure global access to 300 MHz of spectrum in both the 28 GHz and 19 GHz bands for its system's feeder links. Any other alternative, including the proposal for "reverse-band" use of the spectrum at 19.4-19.7 GHz for NGSO MSS feeder links, comes with substantial cost and schedule penalties for TRW, and is not a palatable option.

There is no question but that Odyssey^{TM} can share the proposed NGSO MSS feeder link allocation at 29.1-29.5 GHz with the other NGSO MSS system, as well as with the LMDS and with GSO/FSS uplinks. Indeed, Odyssey's^{TM} use of the 50 MHz segment (at 29.2-29.250 GHz) will actually reduce the burden that would be imposed on the LMDS under the Commission's current proposal. TRW also suggests modest principles to enable NGSO MSS systems such as Odyssey^{TM} and GSO/FSS systems to equitably bear the relatively small burdens associated with co-frequency operation of their respective services at 29.250-29.5 GHz.

In its Comments, TRW also supports the Commission's proposal to designate the 18.3-18.55 GHz band as the paired space-to-Earth band for GSO/FSS uplinks at 29.250-29.5 GHz. Allocation of the lower segment to GSO/FSS would relieve congestion in the 19.45-19.7 GHz band that would otherwise result from the latter band's use for NGSO MSS feeder link downlinks and proposed "reverse-band" NGSO

MSS feeder link uplinks. Indeed, the proposed GSO/FSS allocation at 18.3-18.55 GHz should be made even if the "reverse-band" option is not approved at WRC-95.

Lastly, TRW urges the Commission to finalize its tentative conclusion not to use competitive bidding to assign the spectrum it proposes to allocate to NGSO MSS feeder links, and urges the Commission not to issue a final decision in this proceeding until after the conclusion of WRC-95. In TRW's view, if a decision is taken prior to WRC-95 to preclude satellite systems from 850 MHz of what is known internationally as a satellite band, the prospects that the United States could secure additional and modified satellite allocations in the same band would be dimmed considerably. While it is TRW's hope that the results of WRC-95 are consistent with the Commission's band segmentation proposal, an inconsistent result may require the Commission to reconsider such precipitously-rejected contingencies as the removal of the LMDS to suitable alternate spectrum that the Commission has identified at 40.5-42.5 GHz and TRW's previously submitted proposed segmentation plan for the 28 GHz band.

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COMMENTS OF TRW INC.

TRW Inc. ("TRW"), by its attorneys and pursuant to Section 1.415 of the Commission's rules, hereby comments upon the Commission's Third Notice of Proposed Rulemaking and Supplemental Tentative Decision, CC Docket No. 92-297, FCC 95-287 (released July 28, 1995) ("Third NPRM"), in the above-captioned docket. In the Third NPRM, the Commission proposes, inter alia, to allocate blocks of spectrum in the 27.5-30.0 GHz band for local multipoint distribution service ("LMDS"), non-geostationary and geostationary fixed satellite service ("NGSO/FSS" and "GSO/FSS," respectively) and non-geostationary mobile satellite service ("NGSO MSS" or "MSS") feeder link uplinks. The Commission further proposes rules to

govern auctions in the LMDS and FSS services, and it proposes not to auction the spectrum within this band allocated for NGSO MSS feeder link uplinks.

INTRODUCTION

What started out several years ago as a proposal to allocate 2 GHz of spectrum for a new terrestrial video delivery service has mushroomed into a complex and contentious free-for-all involving multiple terrestrial and satellite service interests. The total amount of bandwidth requested by the proponents of LMDS, GSO/FSS, NGSO/FSS, and NGSO MSS feeder link systems far outstrips the amount of spectrum available at 27.5-30.0 GHz, leaving the Commission with a difficult decision: divide the available bandwidth among competing services so that each gets a usable (if not ideal) allocation, or find alternative spectrum for one or more of the competing services. The Third NPRM represents the Commission's proposed answer. The band would be segmented in a fashion that would allow four radio services access to what is intended to be enough spectrum to establish commercially viable systems.

TRW is licensed to establish an NGSO MSS system called "Odyssey^{TM}" that will have its service links in the 1.6/2.4 GHz bands, and holds a conditional authorization to establish its system's feeder links in 300 MHz of spectrum in the 27.5-30.0 GHz band (the "28 GHz band") for Earth-to-space links and in 300 MHz of spectrum in the 17.7-20.2 GHz (the "19 GHz band") for space-to-Earth links.[1/] The terms and conditions of TRW's authorization to construct its service links --

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1/ See TRW Inc., 10 FCC Rcd 2263 (Int'l. Bur. 1995).

specifically, the requirement that TRW's system conform to the technical parameters detailed in its application -- have fixed its requirement for 300 MHz of feeder link spectrum.[2/] Although it appears that the precise feeder link frequencies proposed by TRW will not be made available for global feeder link operations at the 1995 World Radiocommunication Conference ("WRC-95"), TRW is able and prepared to operate its feeder links in 300 MHz of the 400 MHz in the 28 GHz band and 300 MHz in the 19 GHz band spectrum that the United States Government has proposed that WRC-95 make available for NGSO MSS feeder link use. TRW is also able and prepared to share these feeder link allocations with the feeder link operations of the "Iridium" system -- the NGSO MSS system that was conditionally authorized to be established by Motorola Satellite Communications, Inc. ("Motorola").

Although TRW's requirement for 28 GHz band spectrum for its feeder links has been a matter of public record (including Commission authorizations) for over four years, the Commission chose in its Third NPRM to grease squeakier wheels, and presumed that it could relieve congestion at 28 GHz by satisfying TRW's feeder link requirements in bands other than 28 GHz.[3/] The Third NPRM is devoid of any discussion of TRW's longstanding requirement for feeder link spectrum in the 28 GHz band -- an omission that is made all the more conspicuous by virtue of the fact that the Commission went to great lengths to ascertain and attempt to accommodate the stated requirements of all of the other putative users of 28 GHz band spectrum.

2/ See id. at 2266 (¶ 23).

3/ Third NPRM, FCC 95-287, slip op. at ¶ 26.

In these Comments, TRW undertakes first to set the record straight as to what its feeder link spectrum requirements are. It emphasizes that its system design and business plan are both geared to securing global access to 300 MHz of spectrum in both the 28 GHz and 19 GHz bands for its feeder links, and that it will pursue the use of that band should it be made available for feeder link use. TRW also emphasizes that even though it has championed the proposed use of spectrum at 19.4-19.7 GHz for NGSO MSS feeder links in the Earth-to-space (or "reverse band") direction, that allocation has substantial cost and schedule penalties that make it a distant second in terms of priorities for TRW's Odyssey™ system. The Commission should not have presumed TRW out of the 28 GHz band.

Despite the fact that TRW was arbitrarily singled out for relegation to alternative bands, it has carefully considered the ramifications of the band segmentation plan the Commission proposed in the Third NPRM. It has concluded that its interests can be accommodated within the two co-primary NGSO MSS feeder link segments at 29.1-29.250 GHz and 29.250-29.5 GHz, and thus is using these Comments to support the Commission's band segmentation plan, subject to the adoption of modest sharing principles and fine-tuning adjustments that are designed to facilitate co-frequency sharing between NGSO MSS systems of a design similar to Odyssey™, and LMDS and GSO/FSS systems.

In particular, TRW demonstrates that the use of 50 MHz of spectrum (at 29.2-29.250 GHz) by Odyssey™ will actually reduce the burden on the LMDS of co-frequency sharing with the NGSO MSS feeder links that the LMDS is poised to accept under the Commission's current proposal. TRW also proposes the modest principles

that the Commission should implement to enable NGSO MSS systems such as Odyssey™ and GSO/FSS systems to equitably bear the relatively small burdens associated with co-frequency operation of their respective services at 29.250-29.5 GHz. Integral to both cases is TRW's showing that an overlap in spectrum usage by Odyssey™ and Motorola's Iridium feeder link system is tolerable by both systems.

Notwithstanding its belief that it can share spectrum with LMDS and certain GSO/FSS systems in the 28 GHz band, and its recognition of the difficulties that confronted the Commission in developing the plan now proposed, TRW would be remiss if it did not also state its belief that the Commission may be overly optimistic in its rush to allocate NGSO MSS feeder links in spectrum that is to be shared with other services. The preliminary sharing studies conducted to date do not address the multi-GSO/FSS system environment that is expected to emerge. Canada, which has conducted substantial studies of this issue, has proposed to WRC-95 that 500 MHz of spectrum be allocated to NGSO MSS feeder links (at 29.0-29.5 GHz and 19.2-19.7 GHz) on an exclusive primary basis. TRW urges the Commission to monitor the sharing situation closely and to be prepared to adopt an approach similar to the one taken by Canada if necessary to ensure adequate conditions for NGSO MSS feeder link operations.

On other issues raised in the Third NPRM, TRW strongly supports the Commission's proposal to designate the 18.3-18.55 GHz band as the paired space-to-Earth band for GSO/FSS uplinks at 29.250-29.5 GHz. The lower segment is made available by virtue of the Commission's proposal to allocate 850 MHz of the 28 GHz band for exclusive terrestrial use. Its allocation to the GSO/FSS would relieve the

pressure on the 19.45-19.7 GHz band that will be caused by the latter segment's use for NGSO MSS feeder link downlinks and proposed "reverse-band" NGSO MSS feeder link uplinks. Indeed, the proposed GSO/FSS allocation at 18.3-18.55 GHz should be made even if the "reverse-band" option is not approved at WRC-95.

TRW also strongly supports the Commission's tentative conclusion not to assign the spectrum it proposes to allocate to NGSO MSS feeder links by auctions. TRW agrees completely with the Commission's assessment that the statutory conditions for auctions are not met in this instance, and identifies other factors that militate against the use of auctions for these systems.

Finally, TRW urges the Commission not to issue a final decision in this proceeding until after the conclusion of WRC-95. Given the fact that the conference will convene shortly after reply comments are filed in this proceeding, and that a final decision to preclude satellite systems from 850 MHz of what is known internationally as a satellite band may cause irreparable harm to the prospects that the U.S. Delegation will secure additional and modified satellite allocations in the same band, it makes sense to await the results of WRC-95.

If the results of WRC-95 are substantially inconsistent with the Commission's band segmentation proposal, the Commission can solicit supplemental comments, and consider contingency plans in December. Depending on the outcome of the conference, it may become necessary to revisit such issues as the potential removal of the LMDS to suitable alternate spectrum the Commission has identified at 40.5-42.5 GHz and TRW's proposed segmentation plan for the 28 GHz band. The Commission's tentative conclusions on both of these subjects lack a rational record

basis and, in fact, contradict evidence that is in the record. TRW remains hopeful, however, that the proposed band segmentation plan (as adjusted in the manner it proposes here) will be able to be implemented after WRC-95, and that the need to address these other matters will be obviated.

DISCUSSION

I. IN DEVELOPING ITS BAND SEGMENTATION PLAN FOR THE 28 GHZ BAND, THE COMMISSION FAILED FULLY TO CONSIDER ALL OF THE RELEVANT CATEGORIES OF SPECTRUM USE THAT HAVE BEEN PLACED BEFORE IT.

In order to make a rational decision on how best to allocate spectrum in the 28 GHz band among the multiple classes of users that are vying for access to some or all of the band, the Commission must necessarily examine the stated requirements of the proponents of the various systems that are seeking spectrum assignments. To some extent, this was done.[4/] The Third NPRM reflects that careful consideration was given to the needs of many of the systems (both terrestrial and satellite) that would call the 28 GHz band home, and this consideration included at least one NGSO MSS feeder link system.[5/]

4/ See Third NPRM, FCC 95-287, slip op. at ¶¶ 16 - 32 (describing the particular systems proposing to operate in the 28 GHz band).

5/ See, e.g., Third NPRM, FCC 95-287, slip op. at ¶ 50 (Commission explains that its proposal to locate 150 MHz of the spectrum allocated for MSS at 29.1 to 29.25 GHz "is dictated by the proposed frequency for Motorola's feeder links").

With respect, however, to TRW, which plans a character of use of 28 GHz spectrum that is markedly different from the use planned by Motorola, the Commission made a presumption or series of presumptions that caused it to fail to consider and account for TRW's longstanding proposal to operate the feeder link uplinks of Odyssey™ in 300 MHz of 28 GHz band spectrum. Indeed, discussions of TRW's requirements for 28 GHz band spectrum are absent from the Third NPRM, and the focus was limited to the requirements stated by Motorola and a hypothetical "potential" second MSS feeder link system.[6/]

This omission of any discussion of the actual requirements TRW has stated for feeder link spectrum in the 28 GHz band reverberates throughout the Third NPRM, and has the potential to shatter the fragile balance that is set up in the proposed band segmentation scheme. Although TRW is compelled, for reasons that should be self-evident, to bring the oversight to the Commission's attention in these Comments, it nevertheless believes that the fundamental allocation scheme proposed in the Third NPRM need not be altered. Instead, as explained in detail in Section II below, with the adoption of only a few relatively minor clarifications and adjustments -- all of which are in the nature of fine tuning, and do not require any revisions to the spectrum allocation proposals the Commission has advanced -- TRW is prepared to support the Commission's proposal to allocate the 29.1-29.250 GHz and 29.250-29.5 GHz bands to MSS feeder links on a co-primary basis.[7/]

[6/] See Third NPRM, FCC 95-287, slip op. at ¶ 64.

[7/] The details of the modifications and adjustments TRW is proposing are set forth in Section II of these Comments.

A. From The Time It Filed Its Odyssey™ Application, TRW Has Emphasized Its Intention That Odyssey's™ Feeder Link Uplinks Operate In The 28 GHz Band.

Since 1991, at the very beginning of the Odyssey™ authorization process, TRW has consistently represented to the Commission that its system is designed with Earth-to-space feeder link operations in the 28 GHz band.[8/] In fact, earlier in this very proceeding, the Commission acknowledged TRW's request for feeder link spectrum, on a non-exclusive basis, in the 28 GHz band.[9/]

Nevertheless, the Commission now seems to be under the impression that either TRW is indifferent as to whether feeder link uplinks of Odyssey™ operate in the 28 GHz or 19 GHz band, or whether TRW would prefer that Odyssey's™ feeder link

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8/ See Application of TRW Inc. to the Federal Communications Commission for Authority to Construct a New Communications Satellite System, (May 31, 1991) at 37-38, (Figure IV-3); Amendment to Application of TRW Inc. to the Federal Communications Commission for Authority to Construct a Non-Geostationary Satellite System in the Mobile Satellite Service Above 1 GHz, (Nov. 16, 1994) at 7 ("Odyssey™ Amendment"); TRW Inc., 10 FCC Rcd 2263, 2265 (¶ 15) (1995). During preparations for the upcoming 1995 World Radiocommunication Conference ("WRC-95"), after it had become clear that the spectrum TRW desires in the upper part of the 27.5-30.0 GHz and 17.7-20.2 GHz bands would not be made available globally for MSS feeder link use, the Commission's Industry Advisory Committee acknowledged TRW's "priority" requirement for 300 MHz of feeder link spectrum at 29.0-29.5 GHz and at 19.2-19.7 GHz. See FCC Industry Advisory Committee For the ITU 1995 World Radiocommunication Conference Final Report, at 185 (May 4, 1995).

9/ See Rulemaking to Amend Part 1 and Part 21 of the Commission's Rules to Redesignate the 27.5 - 29.5 GHz Frequency Band and to Establish Rules and Policies for Local Multipoint Distribution Service, 9 FCC Rcd 1394, 1396 (¶ 19) (1994) ("Second NPRM").

uplinks be located in the 19 GHz band.[10/] This is not the case. TRW hereby reiterates that its paramount priority and objective is to secure 300 MHz of contiguous spectrum, on a non-exclusive basis, in the 29.1 - 29.5 GHz and 19.3 - 19.7 GHz bands for Odyssey's^{TM} feeder link uplink and downlink operations, respectively. A solution whereby the 15 and 19 GHz bands -- or any other "candidate" bands -- would be identified for TRW's feeder links comes associated with substantial cost and time penalties for the Odyssey^{TM} program.[11/] TRW, which continues to advocate the allocation of spectrum at 19.4-19.7 GHz (Earth-to space) and 15.45-15.65 GHz (space-to-Earth) for MSS feeder link use, necessarily views these allocations as an alternative that would be turned to only if all NGSO MSS systems are precluded -- actually or effectively -- from using the 28 and 19 GHz bands for feeder links.

10/ See Third NPRM, FCC 95-287, slip op. at ¶ 26 n.20 (the Commission is considering the 19.4-19.7 GHz band as a "candidate[] to accommodate TRW's proposal").

11/ For example, where off-the-shelf equipment exists for satellite receivers at 29 GHz, no space-qualified receive equipment exists today for the 19.4-19.7 GHz band. The nonrecoverable costs to TRW of developing such equipment and associated ground equipment -- for which TRW itself would be the only foreseeable customer -- will be in excess of $50 million. The incremental delay to the Odyssey^{TM} program schedule would range from six to twelve months. Neither of these penalties is tolerable.

B. The Commission's Failure To Consider Odyssey's™ Requirements In The 28 GHz Band Is Not Supported By The Record, And Has The Potential To Render The Entire Band Segmentation Plan Arbitrary And Capricious.

Under the Commission's proposal, Odyssey™ is the only entity seeking to use the 28 GHz band that would be expected to make alternative spectrum arrangements upon adoption of the proposal.[12/] Although LMDS, GSO/FSS and NGSO/FSS would have to adjust their proposals to fit within the Commission's plan, no other proponent is singled out for relegation to alternative bands.

The reason provided by the Commission for treating TRW differently is that TRW initially proposed to operate its uplinks in a segment of the 28 GHz band that the U.S. Government later chose not to propose to WRC-95 as a potential international allocation for MSS feeder links.[13/] This explanation is insufficient to support the Commission's proposed action.

First of all, the United States Government has proposed that 400 MHz of spectrum be made available at 29.1-29.5 GHz and 19.3-19.7 GHz for NGSO MSS feeder link use. As TRW shows below, this is enough spectrum to accommodate both of the current MSS systems that have conditional authorizations to operate feeder link systems in the 28 GHz band.[14/] It also is consistent with the conclusion of the 1995 Conference Preparatory Meeting that two MSS feeder link systems can share 28

12/ Third NPRM, FCC 95-287, slip op. at ¶ 26.

13/ Id.

14/ See Section II, infra.

GHz band spectrum on a co-directional basis.[15/] TRW has made considered and continuing efforts both to shape the terms and conditions of NGSO MSS feeder link network access to spectrum at 28 GHz, and to adjust the characteristics of its Odyssey™ system design to conform to the prevailing expectations. It should be rewarded, not penalized, for the flexibility it has demonstrated.

Second, the Commission has failed to explain why it has singled out TRW's MSS feeder link network for relegation to alternative spectrum but has preserved the ability to assign a "potential" second MSS feeder link network the spectrum in the 28 GHz band that TRW has been pursuing for more than four years.[16/] The purpose of this proceeding is to allocate spectrum for radio services -- not for particular systems.[17/] To the extent that a minimum of 400 MHz of spectrum would be made

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15/ See Report of the Conference Preparatory Meeting for WRC-95 and WRC-97 to WRC-95, at § 3.4.1(d) (concluding that studies indicate that co-directional frequency sharing between the feeder links of two non-GSO/MSS networks is feasible). It was also recognized that there would be unwanted interference between two systems as a result of the statistical likelihood of "in-line" events. Id. For this reason, even after it became clear that spectrum at 29.5-30.0 GHz would not be made available for NGSO/MSS feeder link networks on suitable terms and conditions, TRW supported in the Commission's Industry Advisory Committee process a proposal to allocate 500 MHz of spectrum for NGSO/MSS feeder links -- and thereby to minimize frequency overlaps between Iridium's 200 MHz feeder link proposal and TRW's requirement for 300 MHz of feeder link spectrum. Thus, limited sharing between two feeder link systems is feasible in an environment where all requirements cannot be satisfied in full; it simply is not the optimum solution.

16/ Third NPRM, FCC 95-287, slip op. at ¶ 64.

17/ Third NPRM, FCC 95-287, slip op. at ¶ 1. The Commission's proposal to single out TRW's MSS system also implicates the Commission's legal

(continued...)

available in this proceeding for MSS feeder link networks to use on a co-primary basis, TRW has as great a right as any other entity to receive an assignment of spectrum in that band, and expects to be given the opportunity to modify its license to specify 300 MHz of spectrum in the 28/19 GHz bands following the conclusion of WRC-95.[18/]

The inequity of the Commission's proposed treatment of TRW is compounded by the fact that unlike the other services accommodated by the Commission's proposal, the NGSO MSS systems seeking spectrum in the 28 GHz band are already licensed (except for their feeder links), and their licensees have spent several years and millions of dollars to reach technical and regulatory levels that no other kind of system seeking access to 28 GHz band spectrum has reached. Despite this fact, the particular type of spectrum use being pursued by TRW is proposed to be excluded from the 28 GHz band while every other category of use (most of which were first proposed years after TRW applied for Odyssey^{TM}) would have other service proposals more or less accommodated under the band plan proposed in the Third NPRM.

[17/](...continued)
obligation to treat similarly situated parties alike. See, e.g., Melody Music, Inc. v. Federal Communications Commission, 345 F.2d 730 (D.C. Cir. 1965).

[18/] See TRW Inc., 10 FCC Rcd at 2265 (¶ 15 n.26) ("We will afford permittees and applicants an opportunity to revise their requested feeder link bands, if necessary") (citing Amendment of the Commission's Rules to Establish Rules and Policies Pertaining to a Mobile Satellite Service in the 1610-1626.5/2483.5-2500 MHz Frequency Bands, 9 FCC Rcd 5936, 5998 (¶ 166) (1994) ("Big LEO Report and Order")). In this regard, as TRW has pointed out previously, an allocation of less than 300 MHz for Odyssey^{TM} feeder links directly impacts system capacity and throws into question its economic performance capability.

The Commission has committed itself to identify sufficient spectrum to support NGSO MSS feeder links,[19/] and has stated an expectation in this proceeding that such spectrum would be found in the 28 GHz and 19 GHz bands.[20/] It is difficult to comprehend why the Commission is willing to forsake the interests of licensed and pending MSS systems (e.g., TRW) for putative applicants for services that have yet even to be proposed (e.g., the proposed NGSO/FSS, which would receive a primary allocation of 500 MHz at 28.6-29.1 GHz and 18.8-19.2 GHz despite the fact that no service rules were proposed and no applications were accepted for filing when the Third NPRM was adopted).[21/] Under these circumstances, the Commission should accord equal -- if not greater -- deference to the NGSO MSS systems seeking spectrum in the 28 GHz band.

19/ See, e.g., Big LEO Report and Order, 9 FCC Rcd at 5998 (¶ 166).

20/ Second NPRM, 9 FCC Rcd at 1397 (¶ 22) (citing Big LEO NPRM, 9 FCC Rcd at 1131 (¶ 76) (1994)). See also Big LEO NPRM, 9 FCC Rcd at 1131 (¶77).

21/ The application of Teledesic Corporation for an NGSO/FSS system was subsequently accepted for filing. See Public Notice, Report No. DA 95-1689 (released July 28, 1995).

II. THE ALLOCATIONS PROPOSED BY THE COMMISSION FOR 29.1-29.5 GHZ CAN SATISFY THE REQUIREMENTS OF ALL CURRENT MEMBERS OF THE NGSO MSS FEEDER LINK COMMUNITY IF THE COMMISSION ADOPTS A FEW MODEST CRITERIA TO FACILITATE AND GOVERN CO-FREQUENCY SHARING BETWEEN NGSO MSS FEEDER LINKS AND LMDS AND GEOSTATIONARY FSS SYSTEMS.

As a licensed system that is awaiting only a final feeder link assignment, TRW has much more at stake than many of the other players in the various 28 GHz band proceedings. When it granted TRW a nonconditional license for NGSO MSS service links in the 1.6 and 2.4 GHz bands, the Commission ordered that the system be constructed to the technical specifications set forth in TRW's application.[22/] As TRW explained in its application, and as the Commission recognized in its decision, TRW's requirement for 300 MHz of single-polarization feeder links (including TT&C capabilities) is a direct byproduct and function of Odyssey's™ service link design.[23/] In short, while other parties competing for use of the 28 GHz band are at an early enough stage in the licensing process to have the ability to redesign aspects of their proposed or prospective systems to fit the amount of spectrum to which they may ultimately be given access (only one LMDS user has actually filed applications, and there are likely to be several new satellite applications filed as the September 29, 1995 cut-off deadline for GSO/FSS and NGSO/FSS applications nears), TRW cannot implement the system it has been authorized to establish if it does not have adequate

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22/ TRW Inc., 10 FCC Rcd at 2266 (¶ 23).

23/ See Odyssey Amendment at 5 n.7.

feeder link spectrum assigned to it.[24/] For TRW, the importance of gaining access to its required 300 MHz of spectrum is driven by much more than the already substantial specter of program cost increases and schedule delays.[25/]

There is a silver lining, however, to TRW's advanced stage of system design: TRW's engineers have a much greater ability accurately and quickly to assess whether conditions under which TRW may be allowed to access a particular frequency band can be accepted. Following the release of the Third NPRM, TRW undertook just such a process with respect to the proposed co-primary NGSO MSS feeder link/LMDS allocation at 29.1-29.250 GHz and the proposed co-primary NGSO MSS feeder link/GSO FSS allocation at 29.250-29.5 GHz. In this Section of its Comments, and despite the fact that the Commission erroneously presumed that TRW's stated feeder link requirements are capable of being satisfied in frequencies outside of the 28 GHz band, TRW demonstrates that it can accept the basic segmentations the Commission has articulated for NGSO MSS feeder links, and identifies the modest sharing criteria and associated regulatory revisions and clarifications it believes can

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24/ The other MSS feeder link system seeking access to the 28 GHz band, Motorola Satellite Communications, Inc., is in a similarly constrained position. The Commission, however, appeared to pay greater deference to Motorola's "requirements" than it did to those of the similarly-situated TRW.

25/ If TRW is required to shift to other frequencies (e.g., Ku-band) for Odyssey™ feeder links, the impact on satellite costs alone could exceed $50 million and delay implementation by six to twelve months. This penalty is visited upon no other prospective Ka-band user.

and should be adopted to implement meaningful co-frequency interservice sharing in these bands.[26/]

A. The Commission Should Make A Few Minor Revisions To Its Proposed Rules For Co-Frequency Sharing Between The LMDS and NGSO MSS Feeder Links At 29.1-29.5 GHz -- Revisions That Will Not Increase The Operational Burdens To Be Borne By The LMDS.

If the Commission's proposed allocation of 400 MHz of spectrum to the NGSO MSS feeder link networks (150 MHz of which is to be co-primary with LMDS and 250 MHz of which is to be on a co-primary basis with the GSO/FSS) is adopted, TRW will be required to share spectrum in the 28 GHz band with both LMDS systems (most likely in the form of subscriber-to-hub transmissions) and GSO/FSS uplinks. Because it requires 300 MHz of contiguous spectrum (left-hand circular polarization only) for its feeder link uplinks, TRW would overlap with the LMDS allocation by at least 50 MHz, regardless of where in the 29.1-29.5 GHz band its feeder links are located.

26/ TRW addresses in these Comments only the criteria it is seeking for interservice sharing between the NGSO MSS feeder links and LMDS and GSO/FSS services, respectively. TRW has carefully studied the issue of sharing between the feeder link networks of Odyssey™ (which would operate in the 300 MHz of spectrum in each direction at 29.2-29.5 GHz and at 19.4-19.7 GHz) and Iridium (which would operate in the 200 MHz of spectrum in each direction at 29.1-29.3 GHz and 19.4-19.6 GHz). Despite the fact that there is 100 MHz of overlap between Odyssey™ and Iridium in the Earth-to-space direction and 200 MHz of overlap in the space-to-Earth direction, TRW is convinced that, with geographic separation of feeder link earth station complexes and use of opposite senses of polarization, Odyssey™ and Iridium can share spectrum. An overview of the results of TRW's analysis of sharing between Odyssey™ and Iridium is included as Attachment 1 to these Comments.

In the Third NPRM, the Commission references and revives a private agreement that several participants in the negotiated rulemaking sessions had entered into with respect to LMDS/NGSO MSS feeder link sharing,[27/] and uses this agreement as the basis for its frequency sharing plan between the LMDS and NGSO MSS services.[28/] In a nutshell, the Commission proposes to limit MSS uplinks in the 29.1-29.25 GHz band to eight "feeder link earth station complexes," and identifies a number of procedural and geographical restrictions associated with the specification of sites.[29/]

TRW was strongly opposed to the Motorola/LMDS agreement when it first surfaced during the negotiated rulemaking last year, and it continues to have its doubts as to the advisability and practicality of the proposal.[30/] Nevertheless, if the

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27/ See Third NPRM, FCC 95-287, slip op. at ¶ 60. Contrary to an impression created by the Commission's choice of words, the "agreement" regarding possible frequency sharing between the LMDS and a Motorola-type NGSO MSS feeder link network was not approved by either the Negotiated Rulemaking Committee or the working group of the Committee that was examining sharing issues between the LMDS and NGSO MSS feeder link networks. Nor is its inclusion as an addendum to the Committee's final report significant; all participants were permitted to associate statements of their views with the report. TRW was not a party to the Motorola/LMDS agreement, and in fact joined with a group that proposed an alternative regulatory provision (which is also an addendum to the Committee's final report).

28/ Third NPRM, FCC 95-287, slip op. at ¶ 60.

29/ Id.

30/ Most of TRW's initial objections stemmed from the fact that the proposal effectively limited access to the band to one NGSO MSS system, and was overly-protective of that system (at the expense of NGSO MSS systems with designs that did not require protection to the same degree). See Joint Views

(continued...)

Commission can see fit to make the very modest revisions TRW proposes here to Proposed Sections 21.1002(c) and 25.257 of the Commission's Rules, TRW will swallow its objections and accept the result.

As noted above, for TRW to gain access to its required 300 MHz of spectrum at 28 GHz, it must overlap with the LMDS in at least 50 MHz of spectrum.[31/] TRW will require two feeder link earth station complexes in the United States, but would no longer insist that one of these facilities be located in Los Angeles (at or near the headquarters of its Space and Electronics Group in Redondo Beach) -- which was intended to minimize costs to the Odyssey™ system.[32/]

The Commission's proposal to limit NGSO MSS feeder link earth station complexes was based entirely on the anticipated requirements of Motorola. It is TRW's understanding that although Motorola desires the flexibility to specify eight complexes, it does not intend to construct and operate more than six such facilities.

30/(...continued)
and Proposed Rules for LMDS/Non-GSO MSS Feeder Link Sharing Submitted by Constellation Communications, Inc., Loral QUALCOMM Partnership, L.P., Mobile Communications Holdings, Inc., and TRW Inc., Report of the LMDS/FSS 28 GHz Band Negotiated Rulemaking Committee at Addendum (September 23, 1994).

31/ At present, TRW envisions specifying the 29.2-29.5 GHz segment, in order to minimize the overlap both with LMDS and with Motorola (at 29.1-29.3 GHz). This would entail a 50 MHz overlap with LMDS at 29.2-29.25 GHz.

32/ For reasons that will be made clear in Section II.B below, TRW intends to place one of its complexes in a medium market (MSA 26 or below) on the East Coast, and the other complex in a medium market (MSA 26 or below) on the West coast. An alternative would be to locate the western complex either in Nevada or Colorado (not Denver).